

Samuel Pepys and his stones

Sir Eric Riches MC MS FRCS

Honorary Curator of Historical Surgical Instruments, Royal College of Surgeons of England. Past Treasurer of Christ's Hospital

Introduction

In the early hours of Wednesday 26th May 1703 Samuel Pepys died at Clapham. His death was reported to his friend John Evelyn by John Jackson, his nephew, who advised an autopsy. This revealed a nest of seven stones in the left kidney, irregular in shape, weighing 4½oz; they were linked together and the kidney was entirely ulcerated and adherent.

I begin with his death rather than his birth to show that as well as functional symptoms he had organic calculous pyelonephritis. Recently Newman¹ aptly called the functional symptoms 'the wind of colic'. They included the oft-repeated distension and constipation of mucous colitis, all made worse by anxiety and improved by relief after a successful operation, or on its anniversary, or by the magical properties of a hare's foot, especially if it included a joint as advised by Benjamin Batten on 20th January 1665. Pepys was buried in a vault of his own making near his wife and his brother Thomas at St Olave's Church.

Samuel Pepys, the son of a tailor, was born on 23rd February 1633 at Salisbury Court near St Bride's Church in the City of London. He came from an East Anglian family from whom the Pepys of Norfolk descended. He spent his youth partly in North London at Kingsland and partly in the country at Brampton in Huntingdonshire. He went to Huntingdon Grammar School and from 1646 to 1650 to St Paul's School, where he received a classical education and won a Spendluffe Scholarship at Magdalene College, Cambridge.

In 1653, when he was 20 and still at Cambridge, he had the first symptoms of stone in the urinary tract. After a long walk to Barnwell Abbey on a hot summer day he and his friends slaked their thirst at Aristotle's Well with great draughts of cold water. On return he was seized with the violent pain of renal colic and lay for some days in agony; the

enlightened lay opinion² was that the 'hereditary' stone hitherto lodged in his kidneys was carried into the bladder. Pepys himself attributed it to the weight of water he had drunk; it was attended by haematuria. He recovered and on leaving Cambridge had acquired a wide circle of friends, a taste for beer, and a BA. He was offered employment by his cousin, Sir Edward Montagu, and in 1655, at the age of 22, he fell deeply in love and married Elizabeth de St Michel, a French Huguenot who was only 15.

He soon began to have increasing symptoms of stone. In East Anglia stone in the bladder in children and young people was common. They all had a similar diet and lived in the same environment; his mother, his brother, and his aunt had stone. On 24th August 1660 'he found his Mother was not very well and gave her a pint of sack'. Notwithstanding this sensible treatment her pain became greater and greater and on 5th December she had just newly voided a stone which she had dropped into the fire; she found it again to show to him. She recovered well and lived for six years. His brother John also had the symptoms and 'makes bloody water with great pain, it beginning just as mine did. I pray God help him'. His Aunt Jane at Brampton 'voided a great stone, the first time that ever I heard she was troubled therewith'.

Aetiology and site

In the case of Pepys himself his first stone was formed in the left kidney. There was, however, a high incidence of primary vesical calculus in children which inspired the Norwich school of lithotomy described by Battv Shaw³. Bladder stone was endemic in Norfolk and in the surrounding countryside. Suggested causes were the cold north-east winds, the chalk subsoil with resultant hard water, and the inadequate supply of milk contrasted with

the abundant amount of beer, made from native barley. The standard of living of the farm workers was low; the average diet was deficient in cheese, meat, protein, and vegetables and contained too much cereal. William England⁴ believed that a defective diet was the main cause, but by 1949 Ridley Thomas⁵ found that primary bladder stones in youth had vanished between the years 1910 and 1930. This coincided with the change from grain-producing to mixed farming. Andersen⁶ discounts a lack of vitamin A as a major cause of stones and believes that primary bladder stones are caused by a diet consisting almost exclusively of one cereal. He has shown per contra that stones in the *upper* urinary tract have *increased* concomitantly with a rise in living standards⁷.

Pepys lived well, certainly in comparison with the East Anglian farm labourers. Perhaps that is why his stones started in the kidney; he had them already at the age of 20, passed two (after renal colic) when he was 32, and had them when he died at the age of 70. One that descended to the bladder was removed when he was 25. It did not prevent his taking a degree at Cambridge, working as a clerk in the Exchequer, and getting married.

Primary stones in the kidney, especially when fixed, are more likely to remain 'silent' than those in the bladder, but they cause pain in the back, Pepys's frequent complaint. Either can cause haematuria; a bladder stone more often causes pain on micturition or movement. Pepys evidently had symptoms from both sources—chronic back pain from fixed renal stones and acute renal colic if a stone descended the ureter—as well as the functional symptoms already mentioned.

Vesical calculi coexisting with upper tract calculi are surprisingly rare. Swift Joly⁸ found that out of 197 patients with stone in the upper urinary tract, only 6 (3.04%) had stones in the bladder as well. In a similar series of 564 patients with stones in the upper tract I have found only 29 (5.14%) with stones also in the bladder.

It seems probable that Pepys would fall into this small category of those who have both renal and vesical stones; it was quite usual for him to be unusual.

Composition

Primary stones from the bladder were laminated, the layers varying with the reaction of the urine. Two are illustrated. One from the Middlesex Hospital Museum (Fig. 1), removed by Mr Arnott in 1841, came from a boy of 15 who had had symptoms for 9 years. Another (Fig. 2), from a boy of 14, was removed by lateral lithotomy under general anaesthesia by Mr Henry Mitchell in 1858⁹; it was larger and adherent and slipped from the forceps at the first attempt. Each has a nucleus of uric acid or ammonium urate with layers of calcium oxalate, uric acid, and calcium phosphate. These are the endemic primary bladder stones of East Anglia in the 17th century. J G Crosse¹⁰, a Norfolk surgeon, reported that 55% of bladder stones affected patients under the age of 20.

The picture has now changed; today bladder stone more often affects older patients and is associated with outflow obstruction or infection or occasionally a foreign body or a parathyroid adenoma.

Pepys's symptoms

Although Pepys did not start his *Diary* until he was 27 (1st January 1660), nearly two years after he had been cut for the stone, he left a record, written in 1677 when he was 45¹¹, of the symptoms which made an operation essen-

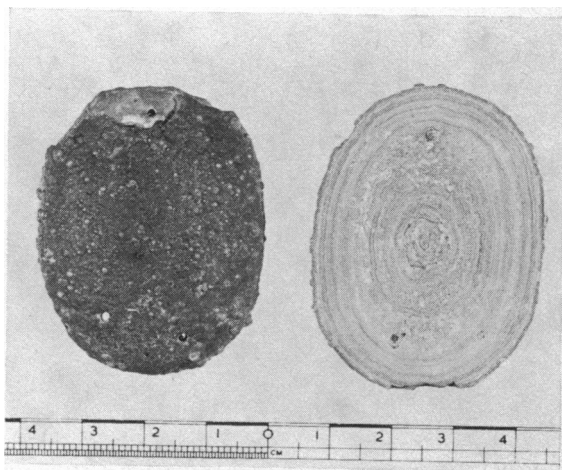


FIG. 1 *Vesical calculus from a boy of 15 removed by perineal lithotomy by Mr J M Arnott in 1841. About the size of the ball used in real tennis as played by Charles II.*

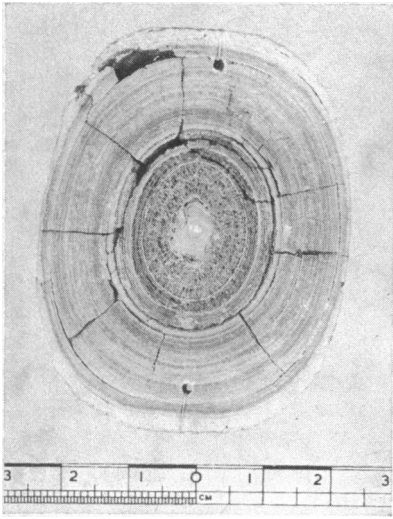


FIG. 2 *Vesical calculus from a boy of 14 removed by lateral lithotomy by Mr Henry Mitchell in 1858. About the size of a modern lawn tennis ball.*

tial. He wrote, 'I remember not my life without the pain of the stone in the kidneys (even to the making of bloody water upon extraordinary motion)'. From the age of 20 the bladder stone gave a constant succession of fits of pain till the age of 25. When the weather was very cold he had to pass urine painfully and frequently and the blood in it alarmed him. He knew that although the operation was common, it was dangerous and painful, and he accepted the decision. He was only a small man but he had great courage and bravely faced the dangers and the pain of lithotomy. In default of an anaesthetic a sponge soaked in a complicated mixture of opiates and mandragora was given to the patient to inhale¹². Speed in operating was essential.

Operations in vogue in 1658

I will tabulate those operations I described to the Section of Urology of the Royal Society of Medicine 41 years ago¹³.

Perineal approach Various types of perineal lithotomy preceded the suprapubic operation.

The lesser operation of Celsus had been used for about 16 centuries. It was intended for children and required only two instruments,

a knife and a hook.

The greater or Marian operation (1522) was used for Pepys. I will give the details but must first say that it was improved by Pierre Franco, who incised the bladder neck instead of tearing it as advised by Paré¹⁴ and often made it a two-stage procedure. This operation remained in vogue until nearly the end of the 17th century. Many of the self-taught itinerant lithotomists used it¹⁵.

Lateral lithotomy replaced the Marian operation. Frère Jacques learnt the technique from Pauloni. After one successful operation he was allowed to operate in Paris. Crowds of up to 200 came to watch him; tickets were issued and guards posted. His mortality was high (40%) so he had to leave Paris and learn some anatomy. It was left to Cheselden of St Thomas's in 1718 to perfect it; he was born too late to operate on Pepys, whose lithotomy preceded Cheselden's appointment by 60 years.

Suprapubic lithotomy

This, 'the high operation', was first performed 'faute de mieux' by Pierre Franco in 1561 on a child of two and used by John Douglas in 1719 and by Cheselden in 1723¹⁶.

Perineal lithotomy has become a rare operation. Cheselden was said always to turn pale when about to cut for the stone and Charles Bell also blanched¹⁷.

Pepys's lithotomy

The lithotomist chosen for Pepys was Thomas Hollyer, of St Thomas's, where he was 'surgeon for scald heads' in 1638. He married a niece of Edward Molins, lithotomist at St Bartholomew's, and succeeded him¹⁸. His son, Thomas junior, became lithotomist at Bart's as well as St Thomas's in association with James Molins. Lithotomists were jealous of their privileges but still flourished as surgeons until 1860^{19, 20}.

Thomas Hollyer (1609–70) was described by John Ward (1647–73)²¹ as the great surgeon who had been a poor boy in Coventry, where his father was a cobbler or at best a poor shoemaker. He was by all accounts a skilful stone cutter; he had been a pupil of Edward Molins and he called in James Molins as a consultant. Hollyer had cut 40 patients in one year and all

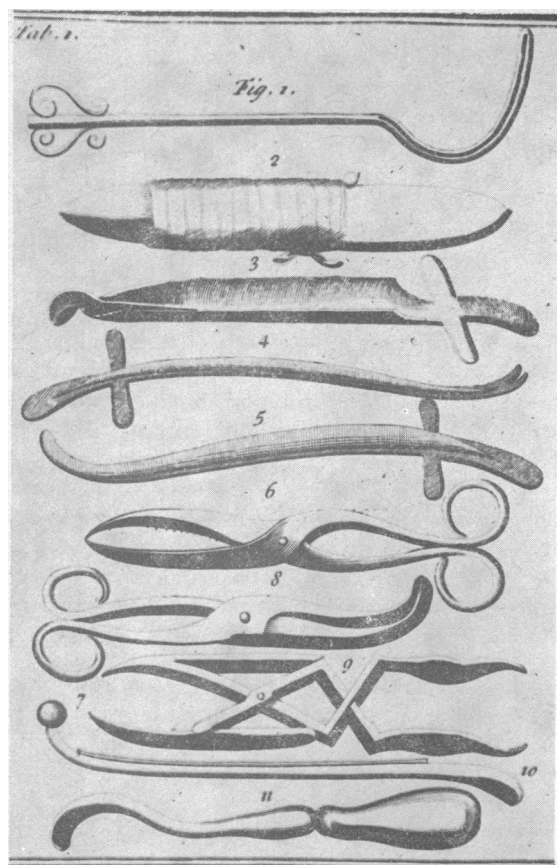


FIG. 3 *Instruments used in the operation by the Apparatus Major. From above: grooved staff, lithotome, gorget, conductors, crow's-beak forceps, duck-bill forceps, Paré's dilator (aperiens), button, scoop. (Reprinted from the Annals of the Royal College of Surgeons²¹.)*

recovered, but the next four all died. One had a ragged stone, difficult and dangerous to remove; for the rest it has been assumed that his instruments, which were never sterilized²², had become septic.

The operation took place on 26th March 1658 at Salisbury Court, the home of Pepys's cousin Jane Turner; only wealthy patients could afford to go into hospital. Dr Molins prescribed elaborate preoperative medication containing mandragora which appears to have been effective. Pepys's relations and friends were present, as was the custom. Preparation a few days earlier was by purging, bleeding, and fomentation to the perineum. He was

placed on the table with his buttocks raised, his legs flexed, and the hands bound to the knees. Immobilization of the limbs was further ensured by four strong men.

A typical set of lithotomy instruments is shown in Figure 3. A curved probe or bougie with a slit on its left side was thrust through the urethra and into the bladder²³. The scrotum was lifted by an assistant to leave the left side of the perineum exposed. A cut was made on to the slit in the probe, no larger than the thumb, avoiding the seam of the perineum and the anal orifice. The gorget was inserted into the opened urethra and the channel kept open with the pair of conductors or guiders. The staff was withdrawn. The voracious and vociferous crows-beak or duck-bill forceps were passed into the bladder to search for the stone. If the opening was too small Paré's dilator was inserted and opened until the forceps with the stone could be withdrawn²⁴. It was examined for cracks or facets; any blood clot or fragments were removed and no pieces left behind. Other forceps were available—for example, Paré's and Aston Keys'. A very large stone could be crushed by heavy forceps (Brodie type) and removed piecemeal.

Pepys's operation was a success. The stone, as big as a tennis ball²⁵, was complete and intact. The wound healed but reopened 40 years later, three years before his death. Pepys had a case made for the stone so that he could show it to encourage others similarly afflicted; it cost him 24 shillings.

The personal experience of another patient has also been described²⁶. He was an intelligent man who had many of the same symptoms as Pepys; they began in 1801 when he was 23 and became worse in stages, including one of constipation and flatulence. By 1811 he had pain, difficulty, chordee, and haematuria and finally could pass urine only on his knees with his head on the bed. A doctor attempted to sound him but failed; the patient then seized the bougie and passed it himself, hitting the stone. Cline did the Marian operation for him in 1812 with no general anaesthetic. He did not wince at the incision; the bougie gave him his first real pain and it was relieved when the bladder was opened; the forceps caused considerable pain. He heard Cline say,

'I have got it', and withdrawal produced indescribable pain because the bladder embraced the stone firmly. He found the operation less painful than some of his previous symptoms. Eighteen months later, after left renal pain, he passed a small stone on three occasions.

Recovery

Pepys was lucky to recover from such an operation with no complications. He was so satisfied with the result that he kept its anniversary on 26th March as a regular festival. In less than two years he was at sea and 'was in as good health as ever in his life'. This was his invariable report on the anniversary, but details of his functional complaints in between times are not lacking.

Four years after the operation (26th March 1662), being again by God's mercy in very good health, he gave a dinner party followed by a musical afternoon. To save his guests from the chores he had a man-cook to dress the dinner and Jane to help with the washing up.

In October 1661 he had an attack of acute left epididymo-orchitis which kept him off work for four days. The old pain returned if he sat too long bare-legged to pare his corns. It continued intermittently throughout 1662 and 1663. Hollyer agreed that it was due to constipation and assured him that it was nothing to do with the stone. Pepys spent several days in bed but was able to go to a very fine lecture at Barber-Surgeons Hall on the kidneys, ureters, etc. and to see the specimens on which it was based. His thirst for knowledge was insatiable. At home he could play a little music, read, teach his wife 'arithmetique', and eat a very good meal 'as much as he used to do'. Hollyer's enema of a pint of strong ale, 4 oz of sugar, and 2 oz of butter produced excellent results. He told him that all the slime in his urine was a good sign and showed there was no fear of the stone. Pepys ended 1663 on a subdued note and 1664 continued on the same lines.

In May an attack produced most extraordinary anguish, crying, and roaring, but on getting by chance on his knees in bed it stopped within an hour and he slept well. Hollyer now thought that the stone had recurred and brought something to try and dissolve it.

It would seem likely that during this period of recurrent pain a stone was passing down the left ureter but getting arrested from time to time. His lumbar pain was persistent and he was very worried, as was his father²⁷. His new general practitioner, Dr Burnett, said he had an ulcer in the kidney.

1665 was an eventful year. In January the orchitis recurred and the severe pain in the left testicle ran up presently into the left kidney and kept aching all night. On the next day, 7th March, the pain became so severe that he had to go home at noon. In bed it began to abate. Anon he rose to pass water and out came two stones, with no pain. Later he passed water again very freely and plentifully.

This was the ultimate stage of the left ureteric colic; the ureter was unblocked, the stones entered the bladder, and were small enough to be passed.

His annual report for 1665 was excellent. Despite the hard winter he never had a fit of colic. He again gave the credit to the hare's foot; he had now bought a hare in order to get the whole foot with the joint in it, which he was told would be more effective.

He still thought that the severe ureteric colic was due to the 'bruise' of the testicle and had no association with the passage of the two small stones.

He began to take a new interest in life and in his lady friends. He still had wind, which was worse if he ate alone, when he ate too much and too quickly. On a cold morning he drank a cup of good drink which, he said, 'I am fain to allow myself during this plague time, my physician being dead and surgeon out of the way whose advice I am obliged to take'. He commented now that *overfasting* had filled him with wind, mightily, and nothing else had done it.

The main event of 1666 was the Fire of London. It extended from Pudding Lane to Pye Corner, fortunately stopping short of Seething Lane. Pepys was anxious and busy but free from urinary symptoms.

The eleventh surgical anniversary was the last one recorded in the *Diary*; his sight was failing. He continued his self-imposed work for the Royal Mathematical School of Christ's Hospital and produced a 'short reflection' of

62 pages.

My time is up. I too must forbear and be contented to set down no more than is fit for you and all the world to know. I cannot refrain from giving you a final message of good will, which I am sure would have been mightily approved of by Samuel Pepys.

References

- 1 Newman, C E (1976) *Records of the Osler Club*, 26th February.
- 2 Bryant, A (1933) *Samuel Pepys, The Man in the Making*, London, Cambridge University Press.
- 3 Shaw, A B (1970) *Medical History*, 14, 221.
- 4 England, W (1830) *Observations on the Functional Disorders of the Kidneys*. London and Norwich.
- 5 Thomas, J M R (1949) *British Journal of Urology*, 21, 20.
- 6 Andersen, D A (1962) *British Journal of Urology*, 34, 160.
- 7 Andersen, D A (1968) In *Renal Stone Research Symposium*, p 7. London, Churchill.
- 8 Joly, J S (1929) In *Stone and Calculous Disease of the Urinary Organs*, p 429. London, Heinemann.
- 9 Mitchell, H (1858) *Transactions of the Pathological Society*, 9, 342.
- 10 Grosse, J G (1846) *Report of the Fourteenth Anniversary Meeting of the Provincial Medical and Surgical Association held at Norwich*. Worcester.
- 11 Bryant, A (1935) *Samuel Pepys, The Years of Peril*. Appendix, p 311. London, Cambridge University Press.
- 12 Garrison, F H (1921) *Introduction to the History of Medicine*, 3rd ed. Philadelphia and London, Saunders.
- 13 Riches, E W (1935) *British Journal of Urology*, 7, 140.
- 14 Keynes, G (ed.) (1951) *Ambroise Paré's Apologie and Treatise*, p 189. London, Falcon Educational Books.
- 15 Desnos, E (1914) *Encyclopédie française d'Urologie*, vol. 1, p 1.
- 16 Cheselden, W (1723) *A Treatise on the High Operation for the Stone*. London.
- 17 Miles, A (1918) *The Edinburgh School of Surgery before Lister*. London, Black.
- 18 Moore, N (1918) *The History of St Bartholomew's Hospital*, vol. 2. London, Pearson.
- 19 Parsons, F C (1934) *History of St Thomas's Hospital*, vol. 2, p 30. London, Methuen.
- 20 McInnes, E M (1963) *History of St Thomas's Hospital*. London, Allen and Unwin.
- 21 Ward, J (1647-1673) *Diary*, transcribed by the Medical Society of London, vol. 1, pp 1-280; vol. 2, p 506.
- 22 Power, d'A (1930-31) *British Journal of Surgery*, 18, 1, 185, 353, 541.
- 23 Riches, E W (1968) *Annals of the Royal College of Surgeons of England*, 43, 185.
- 24 Tolet, F (1708) *Traité de la Lithotomie*. Paris.
- 25 Evelyn, J (1952) *Diary*, vol. 2, p 42, 10th June 1669. London, Dent.
- 26 Marcet, A (1819) *Medical and Chirurgical Transactions*, 10, 1, 147.
- 27 Heathe, H T (1955) *The Letters of Samuel Pepys and his Family Circle*, letters 7 and 164. Oxford, Clarendon Press.